

ON SOME SPECIES OF *CENTELLA* L.

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The complex of forms associated together under *C. glabrata* L. (*Hydrocotyle Centella* Cham. & Schlecht.) has been variously arranged and classified by different writers. In 1820 Richard for the first time separated one as a separate species as *H. bupleurifolia* (Monog. Hydro. 78, 1820). He contrasts this species on the one hand with *H. glabrata* and on the other with *H. triloba*. From the former it is separated by the 3-rayed umbels, from the latter by the entire leaves. Unfortunately neither point is really satisfactory; *C. glabrata* has umbels with 3 rays though these are often so closely approximated as to appear to have more, also, some specimens undoubtedly belonging to Richard's species have some of the leaves toothed. The similarities between *C. bupleurifolia* and *C. triloba* seem to have been overlooked by most subsequent writers who have associated the plant with *C. glabrata*.

Ecklon and Zeyher (Enum. 334—339, 1837) created a number of species out of this group. Among these they included *H. bupleurifolia* but at the same time modified the description of the fruit and involucre so that their interpretation of the species includes Richard's plant and also forms of *C. glabrata* and of *C. triloba*.

Schinz (Bull. Herb. Boiss. III. 410 1895) recognised the species as distinct and described the form with some toothed leaves as new under the name *H. heterophylla*.

The majority, however, have not separated the species but have made a variable number of forms or varieties which are based almost entirely on the shape of the leaf and the degree of hairiness. This scheme started with Chamisso and Schlechtendal (Linnaea 1. 275, 1826). They concluded that the variations were not really separable and described a number of 'formae'. De Candolle (Prodr. IV. 68, 1830) raised these to varieties of which four were named. This plan has been followed since though the number of varieties has been increased. Sonder (Fl. Cap. II. 532, 1853) made a number of subvarieties under the original varieties. Domin (Engler Bot. Janrb. XLI. 164—5, 1909) essentially follows Sonder's arrangement though simplifying the arrangement somewhat.

This utilisation of leaf shape as the essential character for the

classification of the plants is not a satisfactory one. There is a large degree of variation with season and with habitat. As an example, but by no means an extreme one, a plant collected in October had soft oval leaves 2 cm. long and 5—6 mm. across with petioles at least 2 cm. long. The same plants in January were forming much smaller leaves much harder in texture and with quite short petioles; the leaves at this season measured 1—1.25 cm. in length and 3 mm. in width with petioles not over 8—9 mm. Much more extreme cases could be given from varying habitats.

An examination of a large amount of material in the field and in herbaria has shown that if fruit characters are taken along with the vegetative ones a clear separation of the complex into two species is possible. It is unfortunate that much of the material in collections is without fruit. The first of these two species is Richard's *H. bupleurifolia*. As the original description is not complete the essential features are enumerated.

C. *bupleurifolia*.

Stems woody and buried in the ground with tufted erect shoots with short internodes and long prostrate branches with long internodes. Axillary branches on the long shoots have short internodes and may root. Leaves hard, coriaceous, entire or some of those on the long shoots with 2—5 blunt teeth at the tip, generally with long petioles. Umbels 3-rayed, those on the long shoots with male flowers only. Fruit rather large, 5—6 mm. long 4—5 mm. wide, mericarps with 3—5 distinct ridges on each side. Fruit more or less flat topped. Involucre acute not more than half the length of the fruit. (Figs. 1 & 2.)

The plant occurs among sandstone rocks, commonly at the foot of cliffs, on mountains above 1,000 ft.

The synonymy is :—

C. bupleurifolia (Rich.) Adamson comb. nov.

H. bupleurifolia Rich. Monog. Hydrocot. 78, 1820.

H. heterophylla Schinz Bull. Herb. Boiss III, 410, 1895.

H. bupleurifolia var. *tridentata* Eck. & Zeyh. Enum. 335, 1837.

Further, the species has been included along with other plants in the following :—

H. bupleurifolia Eck. & Zeyh. 1. c.

H. Centella f. *latifolia* Cham. & Schlecht, 1. c.

H. Centella var. *latifolia* D.C. Prodr. IV, 69, 1830.

C. glabrata var. *latifolia* and var. *coriacea* Domîn. 1. c.

H. falcata Eck. & Zeyh. 1. c. 335.

H. plantaginea Eck. & Zeyh. 1. c.

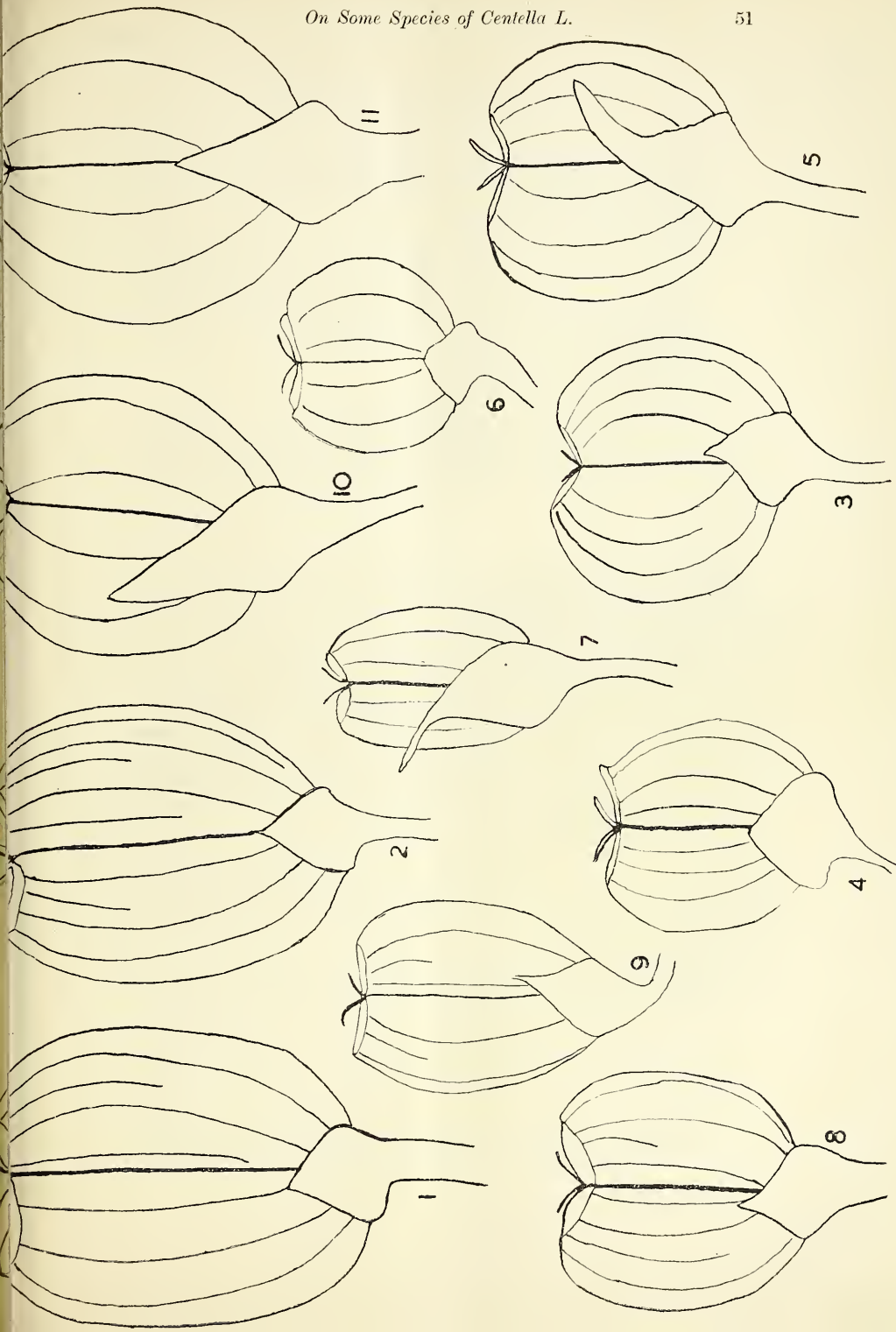


FIG. 1. 1, 2. *Centella bupleurifolia*. 3, 4. *C. glabrata*. 5. *C. glabrata* var. *linifolia*. 6. *C. glabrata* var. *affinis*. 7. *C. glabrata* var. *acuminata*. 8, 9. *C. virgata*. 10, 11. *C. macrocarpa*. All $\times 12$.

The following specimens belong to this species :—

Without exact locality : *Burchell* 7863 ; *Ecklon* 2173 ;

C.B.S. Alexander ; *Ecklon*.

Clanwilliam Div. : Blaauwberg, Drége 7614.

Cape Div. : Constantia, *Ecklon & Zeyher* ; Constantiaberg, *Adamson* 1753, 2099, 2375 ; Tokai, *Ecklon* 407 ; Noordhoek, *Adamson* 2437 ; Steenberg Plateau, *Salter* 272/33, *Adamson* 2107 ; Kalk Bay Mts., *Adamson* 2397, 2531 ; Simonstown, *Ecklon & Zeyher*.

Stellenbosch Div. : Somerset West, *Ecklon* 2174.

Caledon Div. : Houwhoek, *Bowie*.

Uitenhage Div. : Uitenhage, *Zeyher* 1.

C. bupleurifolia approaches *C. triloba* (Thunb.) Drude in habit and fruit shape. It is easily distinguished by the more widely spreading branches, much more cuneate leaves, 3-rayed umbels, and short involucre.

***C. glabrata* L.**

When the foregoing species is separated a much more definite assemblage constitutes *C. glabrata*. This has stems usually branching above the ground level and without any clear distinction into shoots with long and short internodes. The umbels are three-rayed. The fruit is much flattened and rounded in outline and distinctly emarginate at the top. The fruit is smaller than in *C. bupleurifolia*, 2.5 mm. long and about the same in width (Figs. 3 & 4). Each mericarp has 3 thin ridges on the sides. In leaf there is much variation. In texture it is usually thinner and less hard than *C. bupleurifolia*; the shape varies from broadly oval to narrow lanceolate, with usually 3 longitudinal veins. The plants are either glabrous or hairy.

The varieties described by Sonder, Domin, and others are not very satisfactory. Pending a really detailed study of the species, it does not seem possible to subdivide the broader leaved forms on vegetative characters. The following seem to be distinctive varieties both in form and in habitat :—

- var. **linifolia** Domin (*H. linifolia* L. f. Suppl. 176. 1781 ; *H. Centella* var. *linifolia* DC. l.c.) Leaves rolled up and appearing as if linear. Involucre at least half length of fruit (Fig. 5). Dry mountain slopes, local and not common. The variety is often confused with *C. virgata* but is readily distinguished both in habit and in fruit characters.
- var. **affinis** Adamson comb. nov. (*H. affinis* Eck. & Zeyh. l.c. 335). Very slender, with elongated strap shaped leaves on long petioles,

leaves 1 veined with hooked point, fruit sharply bent downwards, otherwise like the type (Fig. 6).

Sand at low altitudes, often near the sea, usually under bushes. The variety has some resemblance to *C. debilis* (Eck. & Zeyh.) Domin. The following belong to this variety :—

C.G.H. *Pappe*.

Cape Div. : Doornhoogte, *Ecklon* ; Table Mt., *Ecklon* 413 ; Stink-water, *Rehmann* 1363 ; Rondebosch, *Schlechter* 1249 ; Signal Hill, *Adamson* 2542 ; Retreat, *Adamson* 2217 ; Bergvliet, *Adamson* 2674 ; Simonstown, *Adamson* 1992 ; Bonteberg, *Adamson* 1818.

Knysna Div. : Krakakania, *Zeyher* 2658.

Without exact locality : *Drege* *H. Centella* var. *linifolia*.

Var. **acuminata** *Adamson* var. nov. A typo differt ; fructibus longioribus quam latis, marginibus plus minusve parallelis, costis dorsalibus prominentibus lateralibus parvis. involucri foliis duobus acuminatis fructum aequantibus vel paullo minoribus. (Fig. 7). A low growing plant with hairy leaves. Fruits flattened of the same size as the type but differing in shape and with long pointed involucre.

Among rocks on mountains above 3,000 ft. Tulbagh and Cold Bokkeveld Mountains.

The following belong here :—

Tulbagh Div. : Tulbagh Kloof, *Ecklon* 2178 (as *H. fusca*) ; Roode-sandberg, *Adamson* 1026, 1069.

Ceres Div. : Cold Bokkeveld Mts., *Adamson* 1064, 1073.

C.B.S. *Harvey* 621.

The plant collected by *Drege* under the name '*H. linearis* E. Mey.' which was placed by *Sonder* (l.c.) under var. *linifolia* subvar. *verticillata*, and by *Domin* (l.c.) under var. *linifolia* f. *rigescens*, seems very distinctive. It has, however, not been re-collected since then.

C. *virgata*.

An examination of much material shows that there are two plants associated under this species which are separable on characters of fruit, habit, and habitat. These have frequently been regarded as constituting two varieties but the distinctions between them are such that they seem quite deserving of individual specific rank. The two are :—

C. *virgata* (L.f.) *Drude* in *Engler & Prantl Die Nat. Pflanzenf.* III.8. 119. 1897.

H. virgata L.f. *Suppl.* 176. 1781.

H. lanuginosa Eck. & Zeyh. *Enum.* 33 7. 1837.

H. fusca Eck. & Zeyh. l.c. (partly).

Erect or suberect often woody with persistent shoots. Umbels with equal rays, the uppermost male only. Fruit longer than broad, flat topped and almost parallel sided. Mericarps with 3—5 small straight ridges on each side, the middle ones often incomplete (Figs. 8 & 9). Fruits finally bent down.

An exceedingly variable species in habit, size, rigidity of leaves, and other features. The various forms need careful study. *H. filicaulis* Eck. & Zeyh. l.c. 338, *H. trichophylla* Eck. & Zeyh. l.c. 338, and *H. alpina* Eck. & Zeyh. l.c. 334, seem to be dwarf and slender forms found growing at higher altitudes.

C. macrocarpa (Rich.) Adamson comb. nov.

H. macrocarpa Rich. Monog. Hydroc. 80. Pl. 67. f. 40. 1820.

C. virgata var. *macrocarpa* Domin l.c.

H. virgata var. *macrocarpa* DC. Prodr. IV. 69. 1830 (this var. is often attributed to Cham. & Schlecht. Though they did describe it they did not give names to the segregates of *C. virgata*).

Erect or spreading, usually herbaceous with annual shoots. Upper umbels male only, others with ray with complete flower shorter than others. Fruit larger than in *C. virgata*, 5—6 mm. long, as broad as long, round in outline, distinctly emarginate at the top. Mericarps with 2 prominent curved ridges on each side, much wrinkled between when dry. (Figs. 10 & 11). Fruit stalks straight erect.

Damp places on sand and on peaty soils, rarely above 1,500 ft. The following belong to this species :—

Clanwilliam Div. : Ezelbank, *Drege* 7624 ; Wuppertal, *Drege* 7623.

Cape Div. : Doornhoogte, *Ecklon & Zeyher* ; Table Mt., *Ecklon & Zeyher* 2181 ; *Pappe* ; Kenilworth, *Adamson* 579, 1197 ; Wynberg, *Ecklon* ; *Wallich* ; Constantiaberg, *Wolley-Dod* 655 ; *Salter* 1172 ; *Adamson* 2388 ; Simonstown, *Wright* ; *Wolley-Dod* 1982 ; *Adamson* 2343.

Stellenbosch Div. : Hottentot's Holland, *Ecklon & Zeyher*.

Worcester Div. : Du Toit's Kloof, *Drege* 1836.

Swellendam Div. : Swellendam, *Mund* 91.

Without exact locality : *Burchell* 464, 3585 ; *Drege* 7663 ; *Harvey* 628, 630 ; *Masson* ; *Pappe* ; *Zeyher* 7, 613, 727.